TABLE 7

| Composite resin used | Bonding strength to enamel ($kg/cm^2$) [immersed in water at 37° C.] After 1 day | After 1 month | After 6 months | After 1 year |
|---|---|---|---|---|
| Bis-GMA type | 95-100 | 95-100 | 90-95 | 85-90 |
| Novel | 110-120 | 110-120 | 105-110 | 100-105 |

It is noted from Table 7 that when using, as the bonding agent, the bonding composition of the present invention in filling the tooth with the said Bis-GMA type composite resin and the said novel composite resin, it is much less in the lowering of the bonding strength even in the case of immersing over a prolonged period of time at such conditions as under water at 37° C.

## EXAMPLE 8

By using fresh, extracted, sound, human teeth (2 each of anterior teeth, premolars and molars) the degree of fuchsin penetration was assessed by conducting the following test based on the said "method of percolation test."

On that occasion, the same novel composite resin as that of Example 6 was used as the composite resin and the same composite composition as that of No. 9 of Example 1 was used as the bonding agent.

As the result of this test the number of "n" for the subject of measurement of the degree of fuchsin penetration was 48, but in either case, there was recognized no fuchsin penetrating phenomenon and average degree of fuchsin penetration was 0.

That is, what is implied by this is that by jointly using the novel composite resin discovered by the instant inventors as mentioned in Example 6 and the composition used in No. 9 of Example 1 being the composition of the present invention bonding extremely durable to the environmental temperature changes could be brought about in the interface between the tooth and the filling material.

We claim:

1. A bonding composition consisting essentially of
(A) from 30 to 99.8% by weight of at least one polymerizable monomer selected from the monomer group consisting of acrylate esters, methacrylate esters, acrylamide derivatives and methacrylamide derivatives, wherein all the members of said monomer group contain a carboxyl, epoxy, amino or hydroxyl group in the molecule,
(B) from 70 to 0.2% by weight of at least one member selected from the group consisting of
(B-I) alkoxy-containing titanium compounds having the formula

$$R_9O-\underset{OR_8}{\overset{OR_6}{\underset{|}{\overset{|}{Ti}}}}-OR_7$$

wherein $R_6$ is a $C_{1-20}$ aliphatic hydrocarbon having up to two substituents selected from the group consisting of hydroxyl, $C_{1-3}$ alkoxy and di(hydroxyalkyl)amino in which the alkyl has 2 or 3 carbon atoms, $R_7$, $R_8$ and $R_9$, which are the same or different, have the same meaning as $R_6$ and additionally include a group of the formula

$$R_{10}\underset{\underset{O}{\|}}{C}-$$

wherein $R_{10}$ is

$$CH_2{=}CH-,\ CH_2{=}\overset{\overset{CH_3}{|}}{C}-$$

or $C_{1-20}$ saturated aliphatic hydrocarbon containing up to two substituents selected from the group consisting of hydroxyl, $C_{1-3}$ alkoxy and acyl having the formula

$$-\overset{\overset{O}{\|}}{C}R_{21},$$

wherein $R_{21}$ is alkyl having 1 to 3 carbon atoms, and

(B-II) silane compounds containing at least three alkoxy groups in the molecule,

a catalyst for the polymerization of the composition and an activator for the formation of free radicals by reaction with the catalyst.

2. A bonding composition according to claim **1** which contains 50–99.5% by weight of said component A and 50–0.5% by weight of said component B.

3. A bonding composition according to claim **1** or claim **2** in which said component A is acrylate ester or methacrylate ester having the formula (1):

$$(Y)_m-Z-\left[-O\overset{\overset{O}{\|}}{C}-\overset{\overset{R_1}{|}}{C}{=}CH_2\right]_n \qquad (1)$$

wherein

n is a positive integer of 1–3,

m is 1 or 2,

Y is —OH, —$NH_2$, —CH—$CH_2$ (epoxy, bridged by O), —$\overset{\overset{O}{\|}}{P}$... i.e. $-\overset{\overset{O}{\|}}{O P}(OH)_2$ or —COOH,

Z is a $C_{1-25}$ organic group having a valence of (n+m) and

$R_1$ is hydrogen or methyl.

4. A bonding composition according to claim **3** in which, in the formula (1),

Y is —OH, —$NH_2$, —CH—$CH_2$ (epoxy, bridged by O) or $-\overset{\overset{O}{\|}}{O P}(OH)_2$.

5. A bonding composition according to claim **1** or claim **2** in which said component A is acrylamide derivative or methacrylamide derivative having the formula (2):